



europeana
think culture

Linked Open Europeana: Semantic Leveraging of European Cultural Heritage

<http://www.slideshare.net/gradmans/>

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Overview



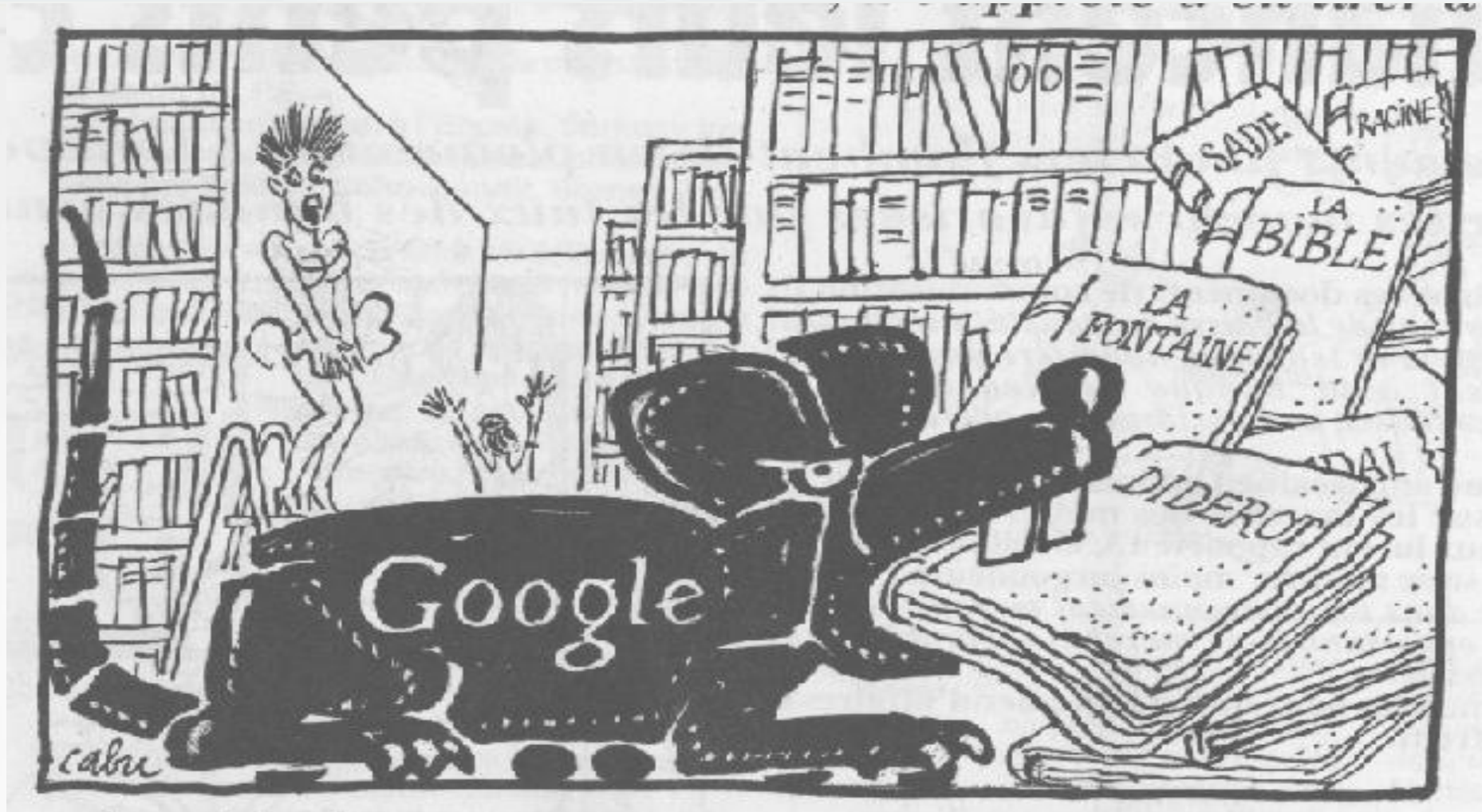
- **Europeana:** How did it start? What has been achieved to date?
- **Linked Data:** What is it, how does it work?
- **Linked Europeana ...**
Object Representations in Context
- **... and what can you do with that?**
- **Conclusion:** on the importance of being 'open'



Europeana 2005 - 2011



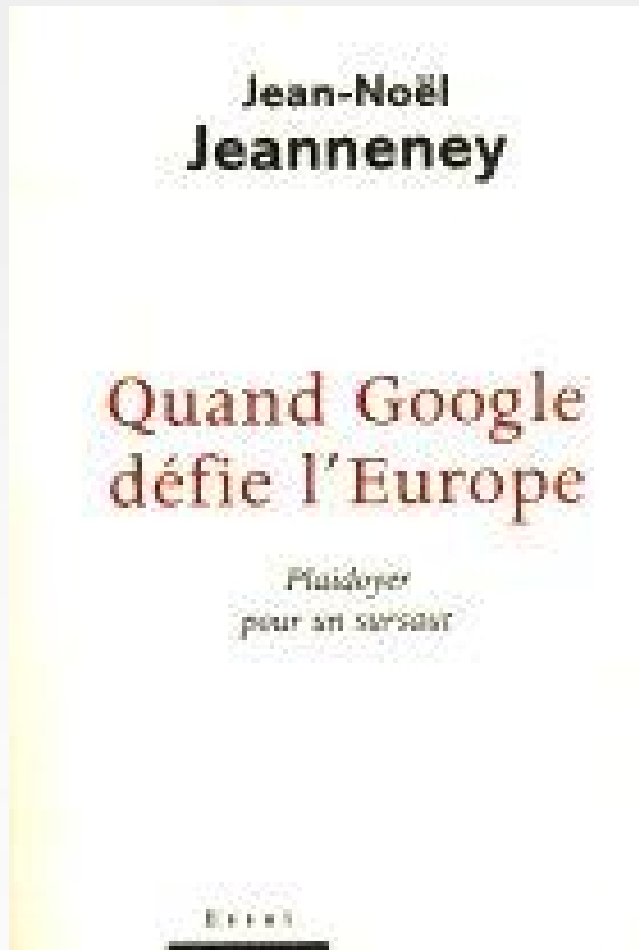
How Europeana Came About



Google Books in 2005 as seen by the Canard Enchaîné ...



Europeana 2005 - 2011

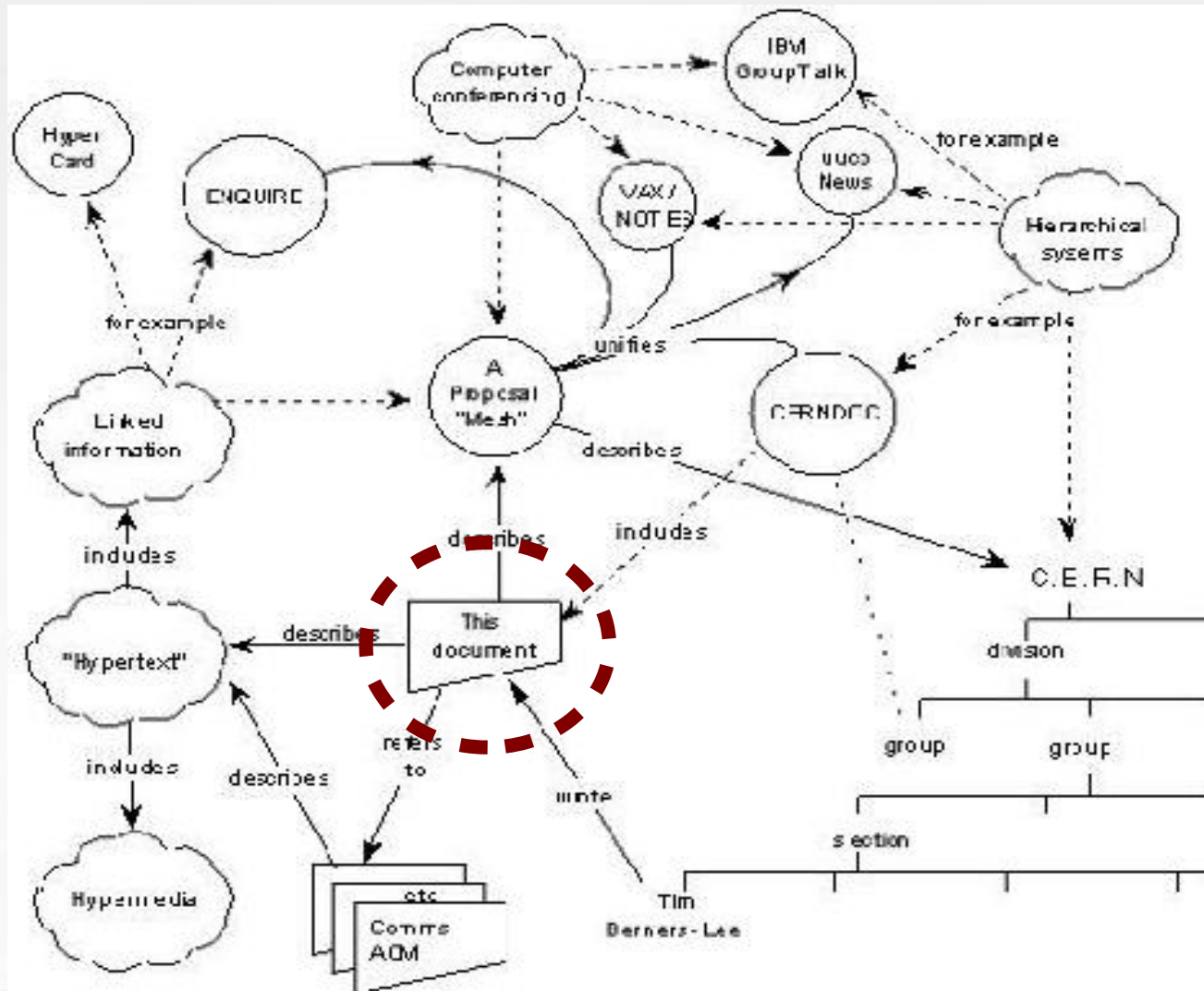


- ... and by Jean-Noel Jeanneney
- → Joint declaration of six European Governments ... Chirac and Schröder among those!
- Declaration by Commissioner Reding on the “European Digital Library” flagship as part of i2010.
- Launch (and crash) of a first prototype 20.11.2008
- Constant growth and stable operations since then, > 15M objects represented to date
- Still basically yet another portal, a big one – but nothing innovative ...

From the Web of Documents to the Web of Linked Data

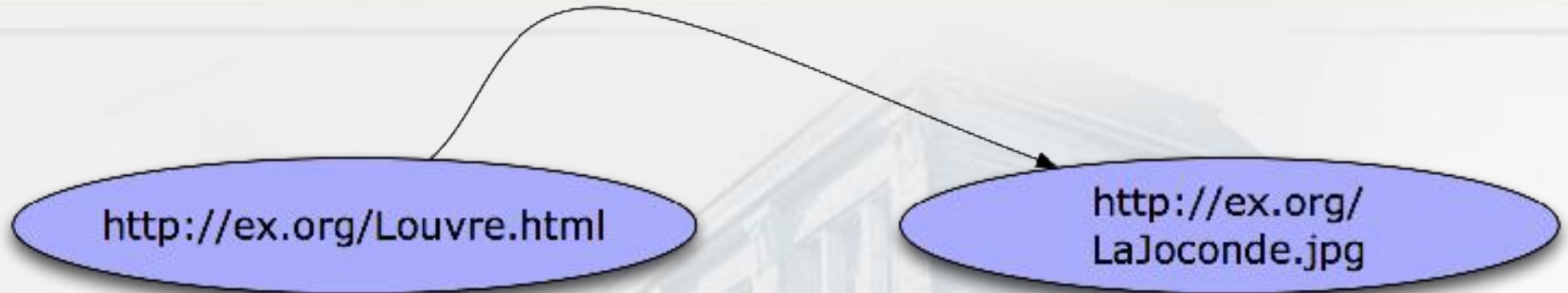


The Web of Documents



Information Management:
A Proposal
(TBL, 1989)

Resources and Links in the Document Web



```
<a href="http://ex.org/LaJoconde.jpg">b</a>
```

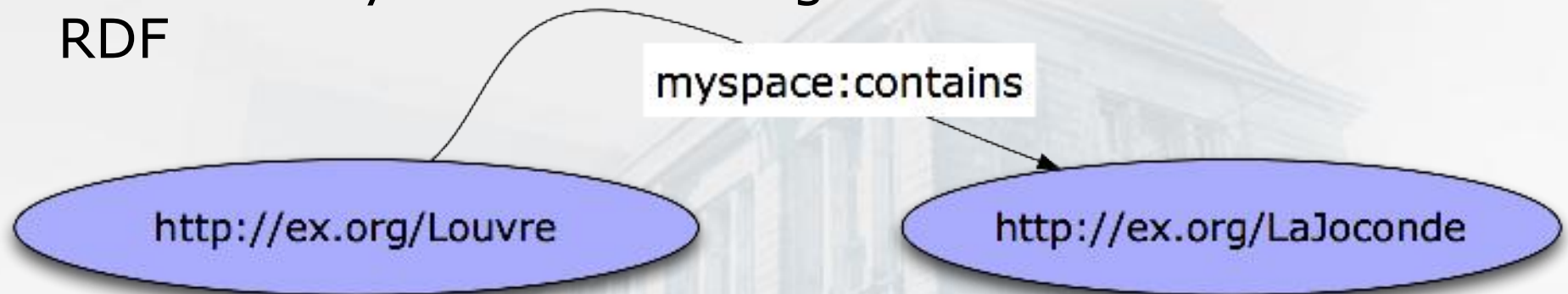
- We have HTTP URIs to identify resources and links between them – but we are missing a few things!
- What kinds of resources are 'Louvre.html' and 'LaJoconde.jpg'?
 - A machine cannot tell.
 - Humans can: we recognize implied context!
- How exactly do they relate to each other?
 - A machine cannot tell.
 - Humans can: again we recognize implied context!



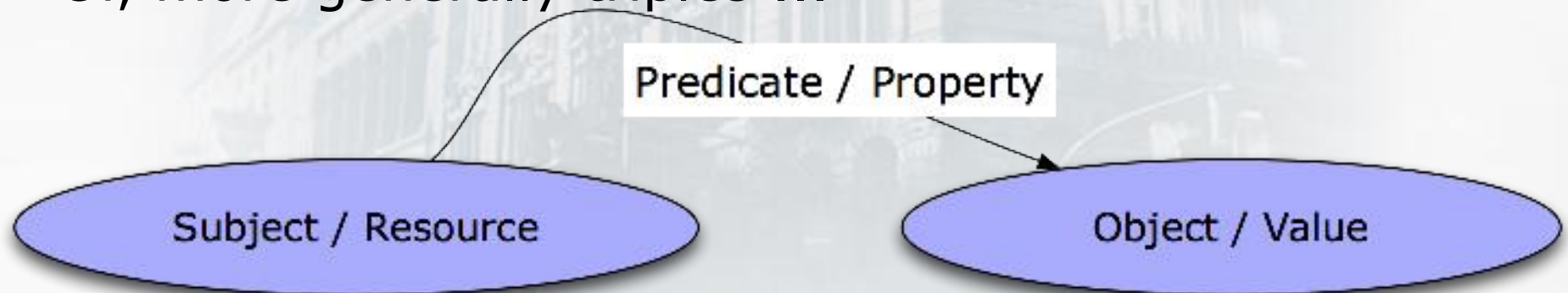
Syntactically Extending the Document Web (1)



- We add a syntax for making statements on resources: RDF



- Or, more generally triples ...



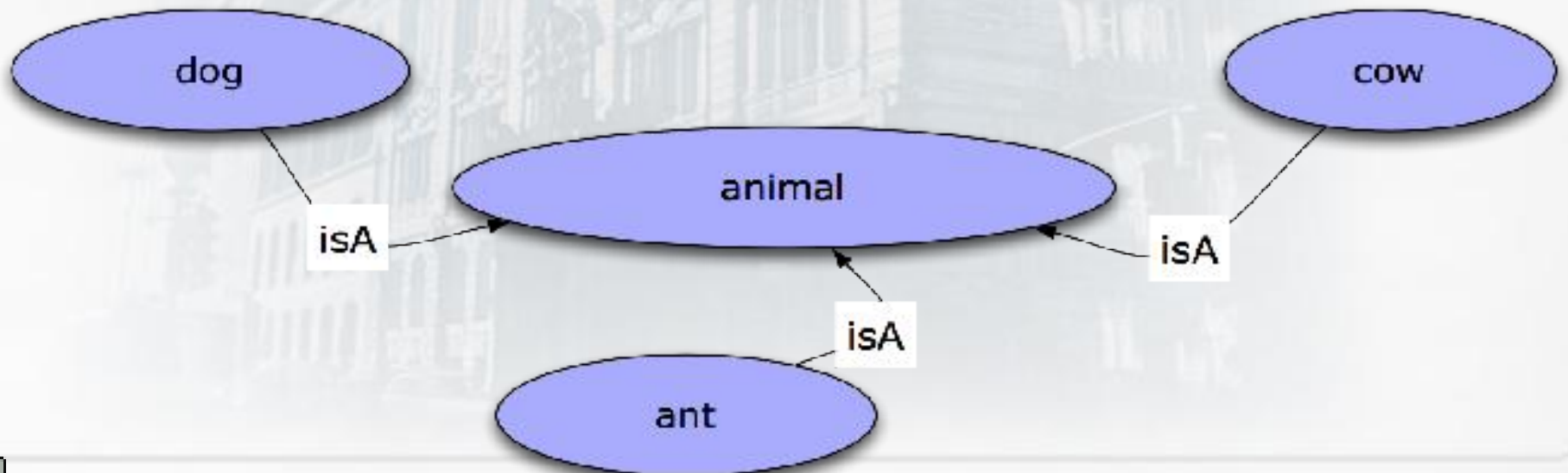
- ... where S and P are web resources (identified using URIs) and O is either a web resource or a literal



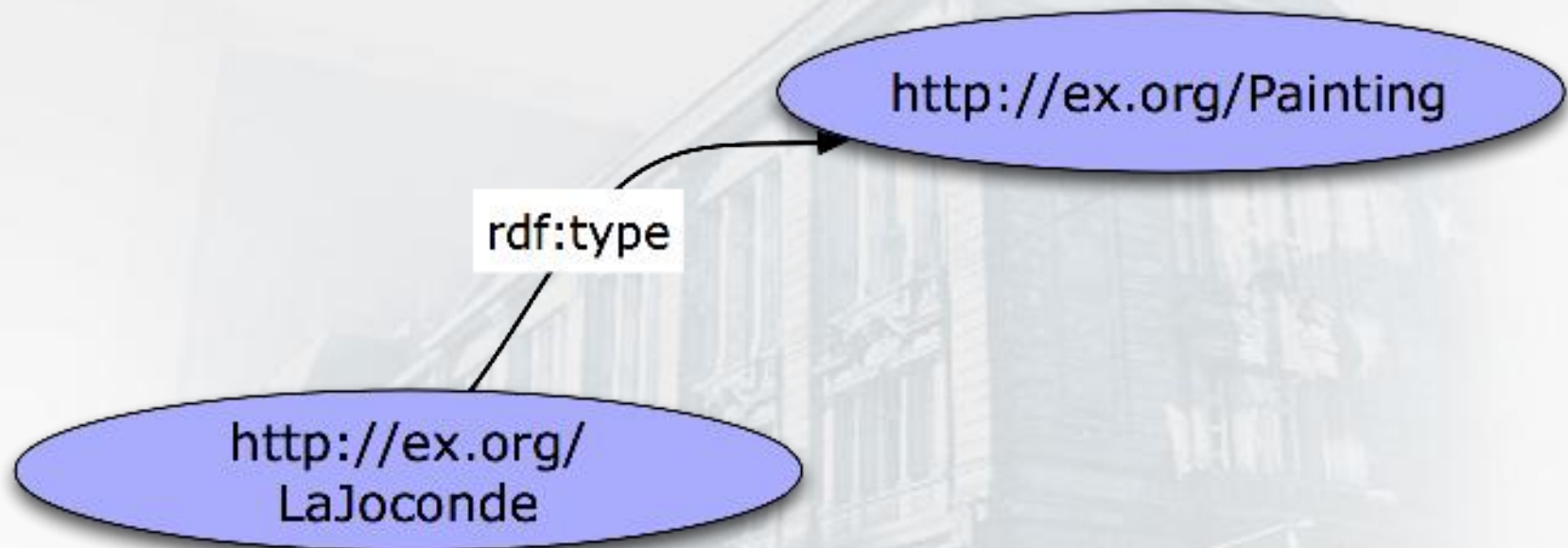
Syntactically Extending the Document Web (2)



- We add a schema language (RDFS) with elements such as
 - classes,
 - hierarchies of classes and properties,
 - inheritance
 - support for basic inferencing.
- And thus are able to establish structures in triple aggregations resulting in lightweight domain ontologies:



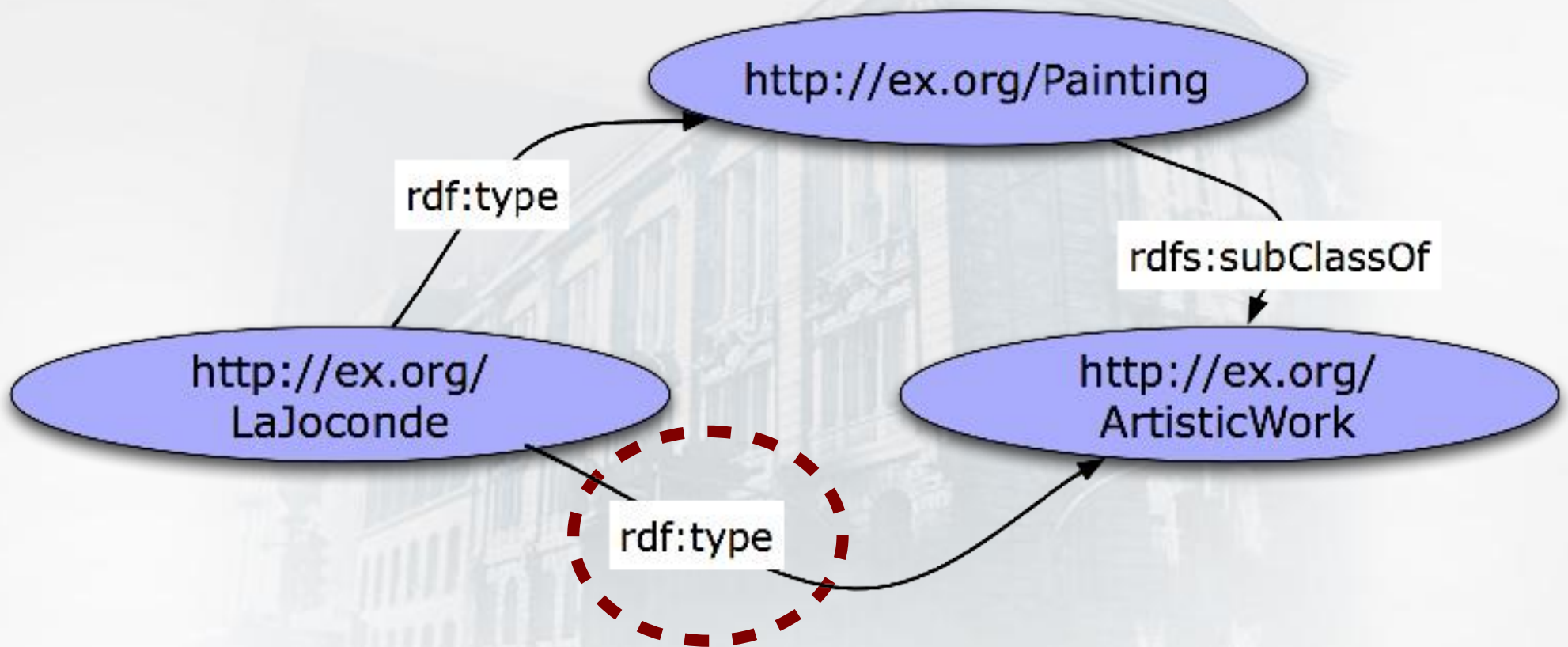
... and new opportunities: Triple Sets and Reasoning (1)



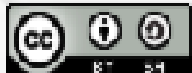
Triple Sets and Reasoning (2)



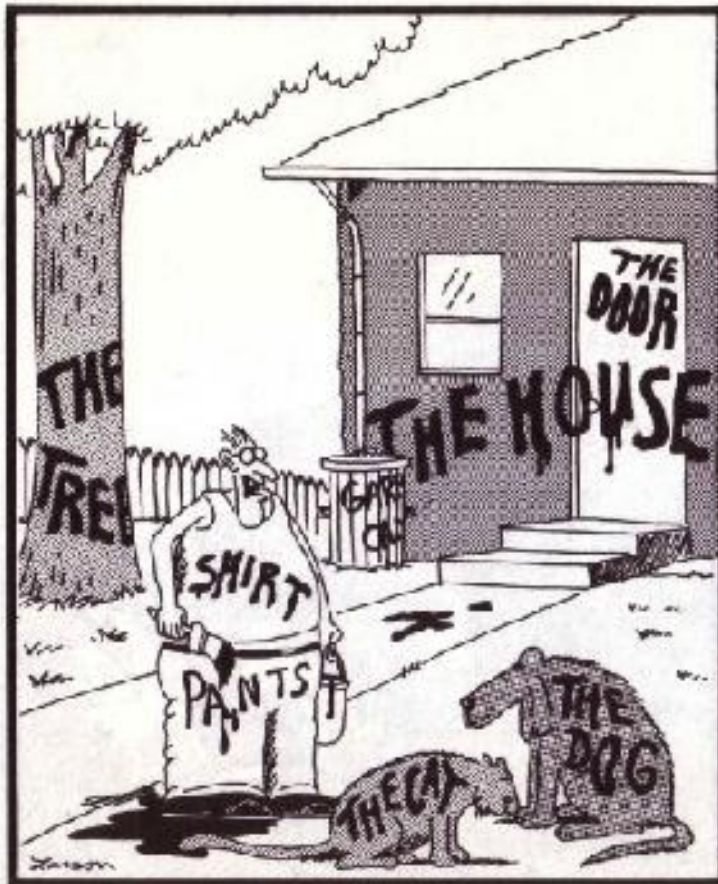
Triple Sets and Reasoning (3)



→ **Potential of novel digital heuristics!**



The Web of Things ... Somewhat Mistaken



"Now! ... That should clear up
a few things around here!"

Taken from Ronald Carpentier's Blog at
<http://carpentier.wordpress.com/2007/08/08/1-2-3/>

- Something **is** wrong with this picture (but what?)
- But basically we extend the WWW in **syntax** (RDF) and in **scope** (enable representation of virtually *everything* in the Web). And this results in ...



... Linked Data

Linked Data essentials

1. Use URIs Standard **Identifiers**
2. Use HTTP URIs Standard **Pointers**
3. Serve useful information using SPARQL, RDF standards
4. Mention URIs of related objects Standards for **Queries** and **Statements**

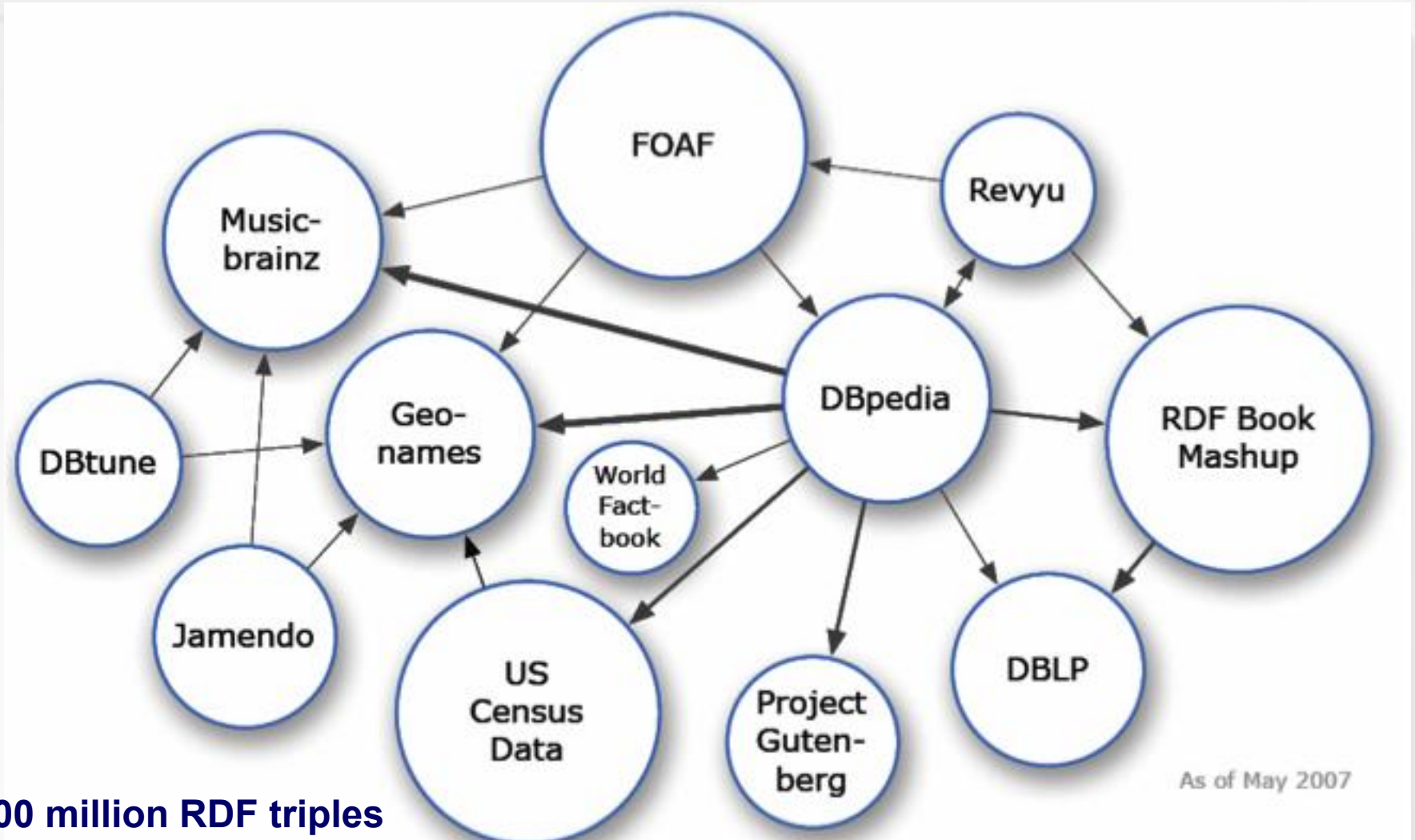
Link to Context

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[http://www.w3.org/2008/Talks/0617-lod-tbl/#\(4\)](http://www.w3.org/2008/Talks/0617-lod-tbl/#(4))



A few Bubbles: 5/2007

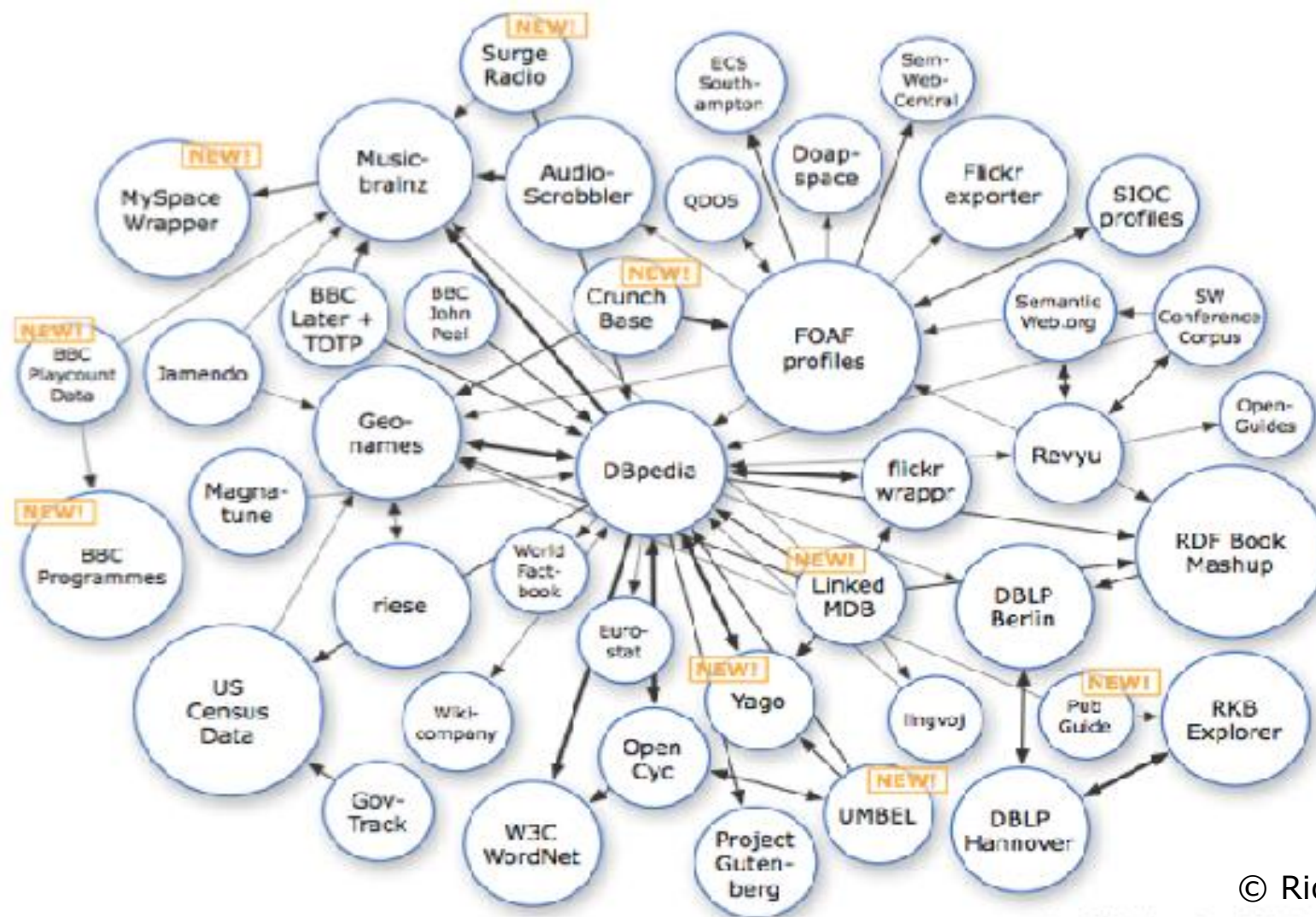


- Over 500 million RDF triples
- Around 120,000 RDF links between data sources

© Richard Cyganiak



Quite some Bubbles: 9/2008



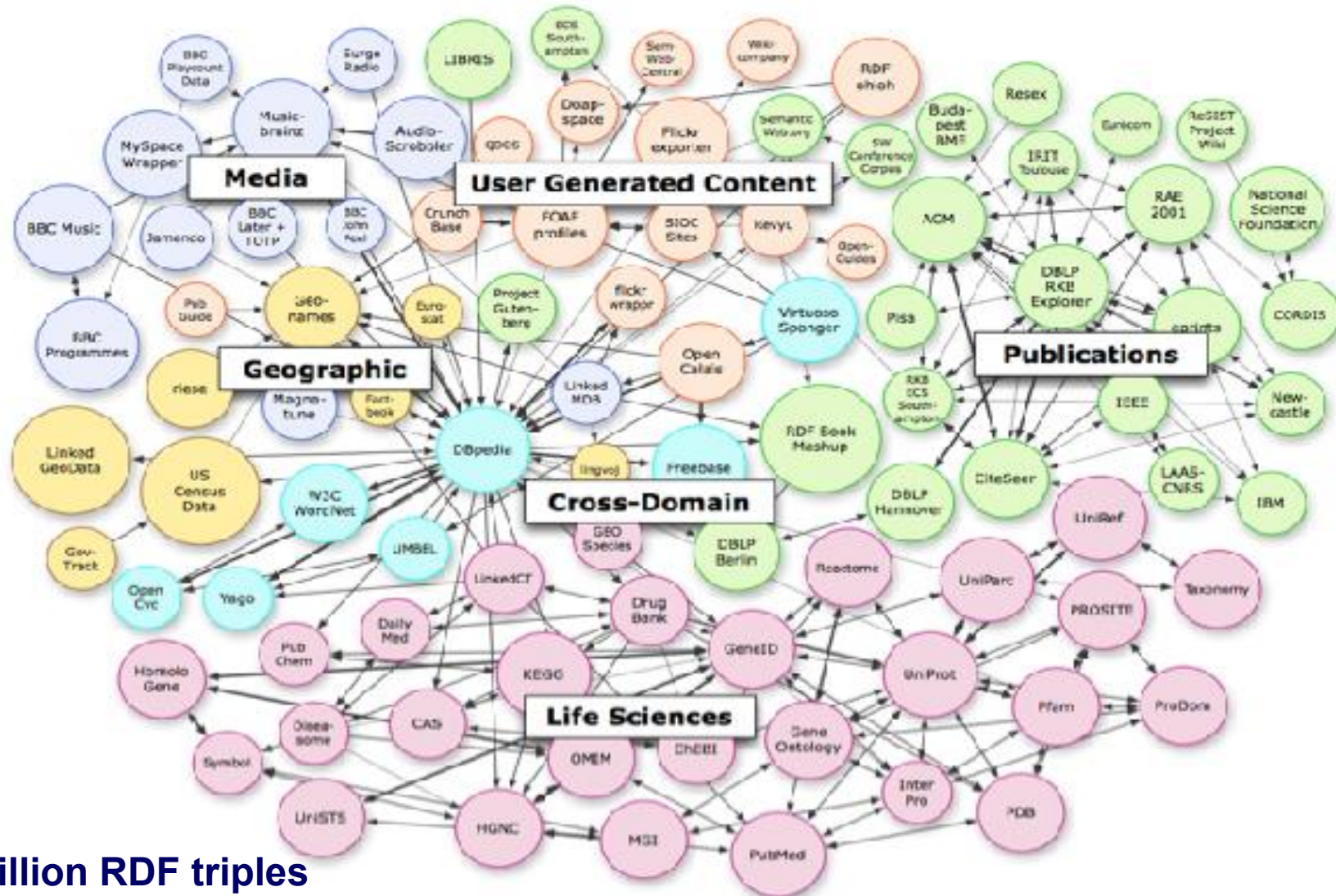
As of September 2008

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Many Bubbles: 7/2009



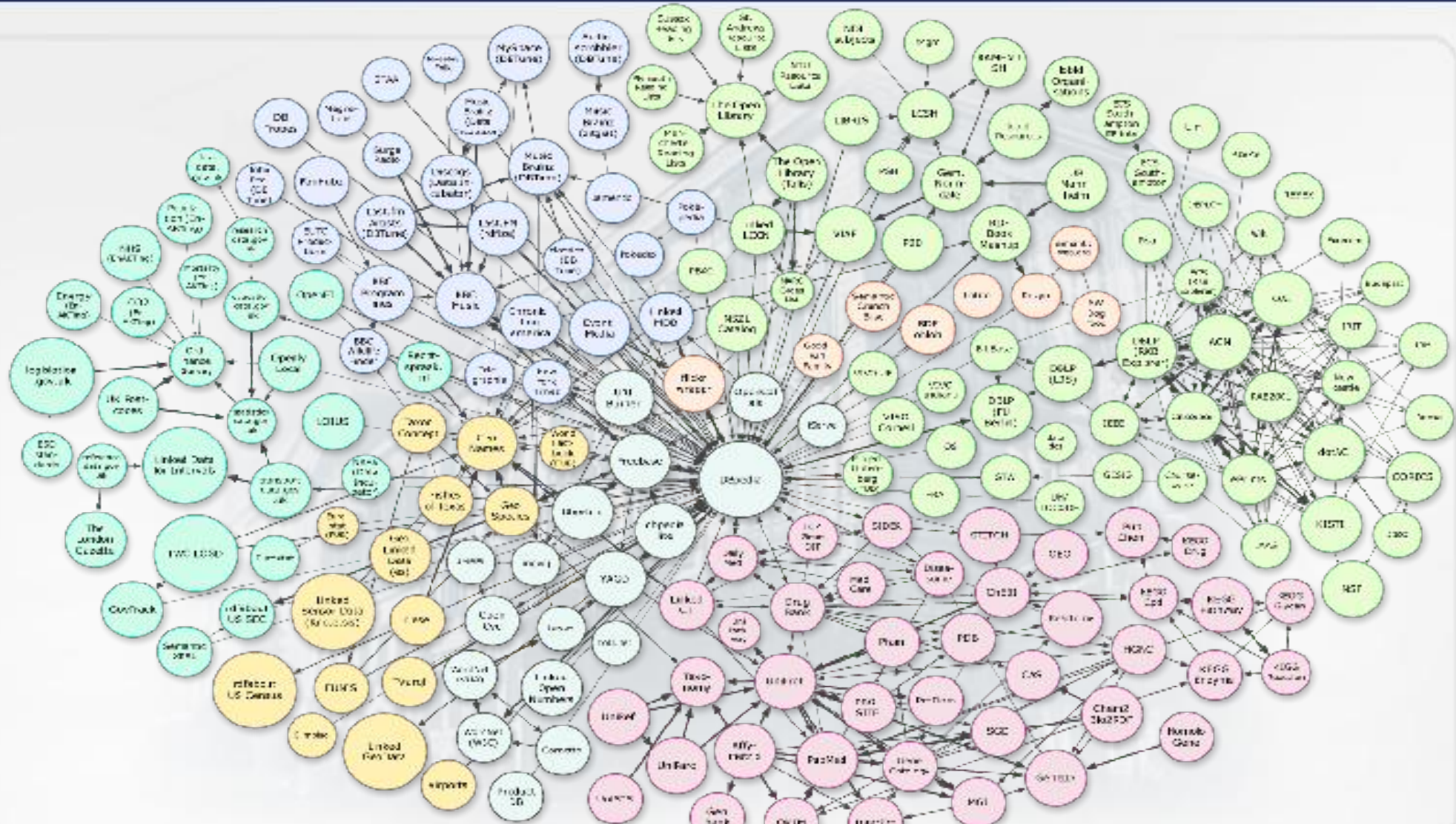
■ Over 13.1 billion RDF triples
Over 142 million RDF links between data sources

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(Too?) Many Bubbles: 9/2010



http://richard.cyganiak.de/2007/10/lo/lo-datasets_2010-09-22_color.html

As of September 2010

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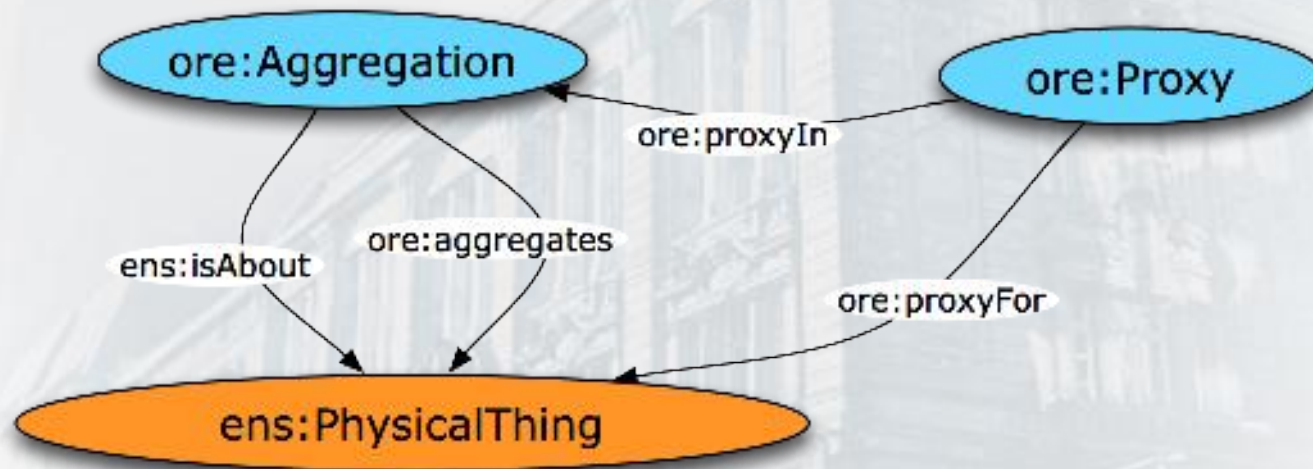
The Europeana Data Model (EDM) Making Europeana Part of Linked Data



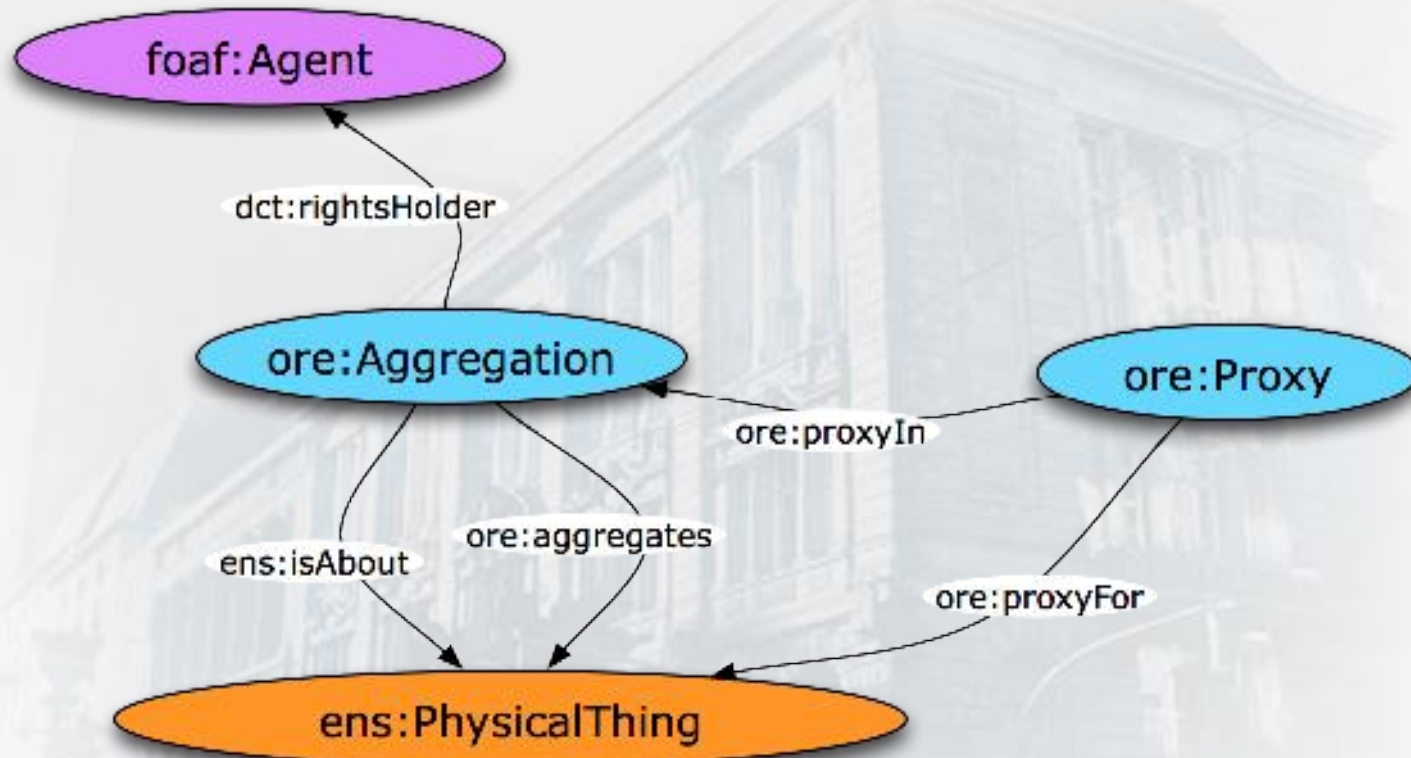
“Europeana Data Model” (EDM)

- destined to replace the current model (ESE) with the 2011 release of Europeana
- Builds a roof on top of various cultural heritage domains (Archives, Museums, Libraries, Audio-Visual)
- Builds on standards such as SKOS, DCterms and OAI-ORE ...
- allows for Semantic Web representation of Cultural Heritage

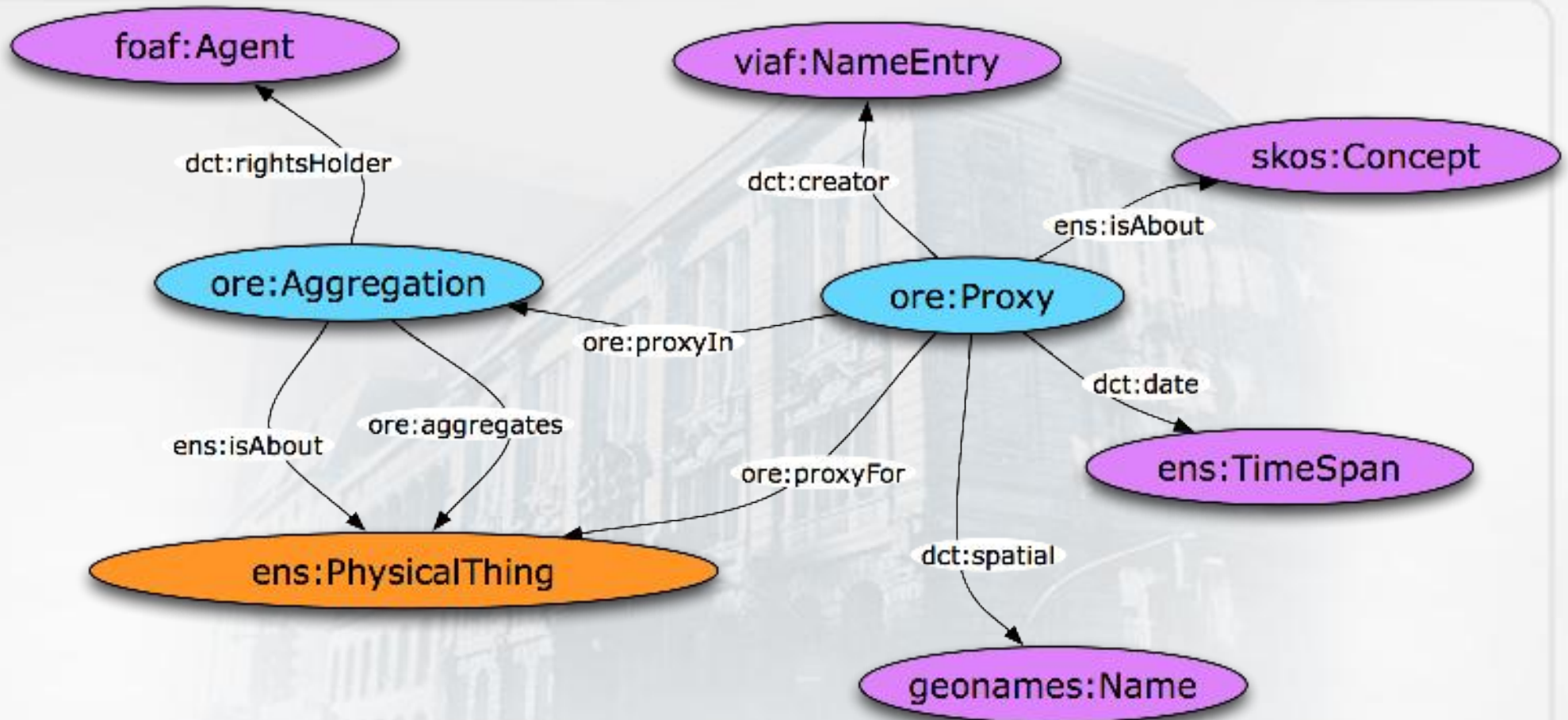
An Aggregation ...



... some context



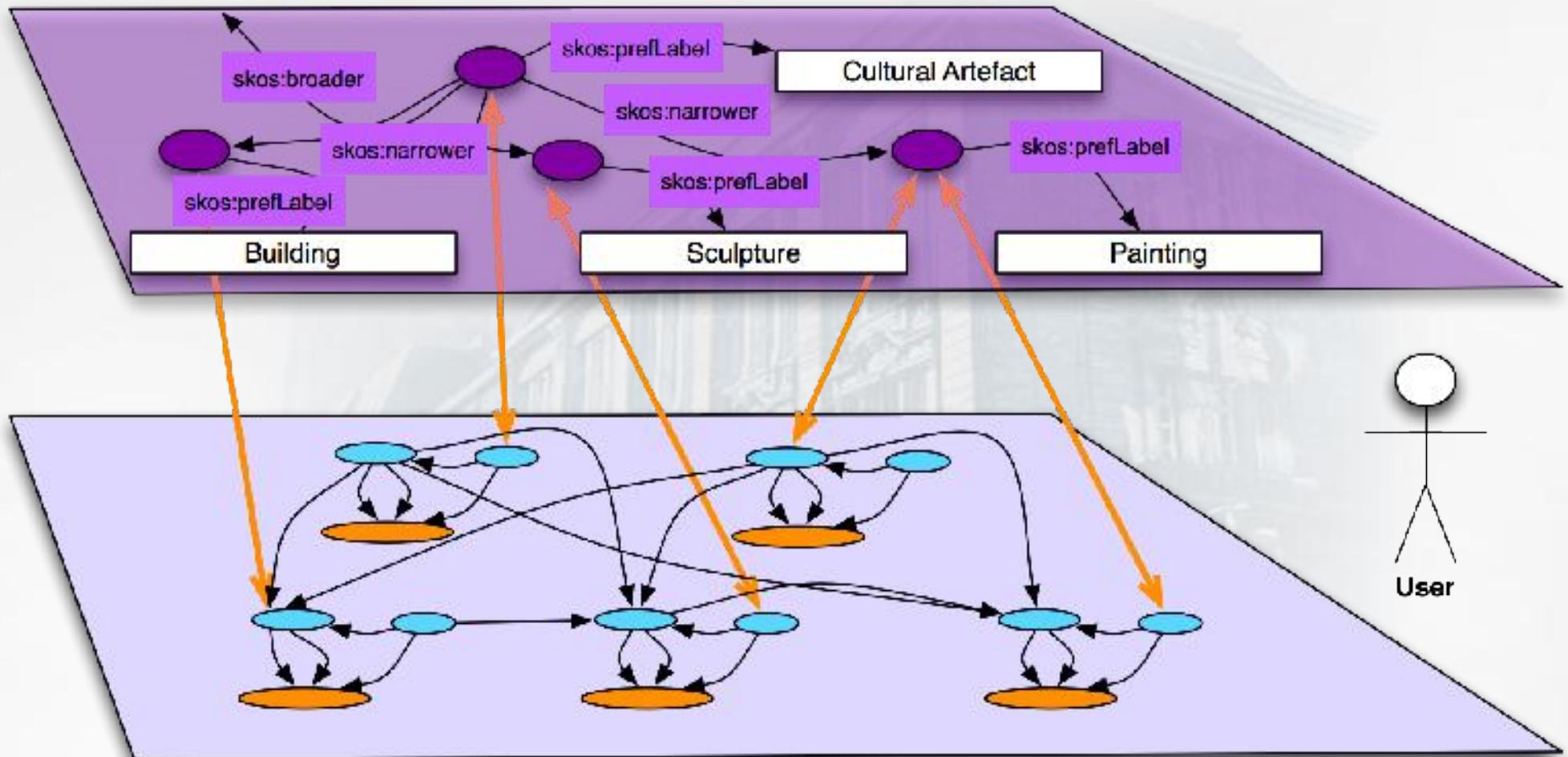
... more context



... and the Big Picture: The Semantic Data Layer



Semantic Network

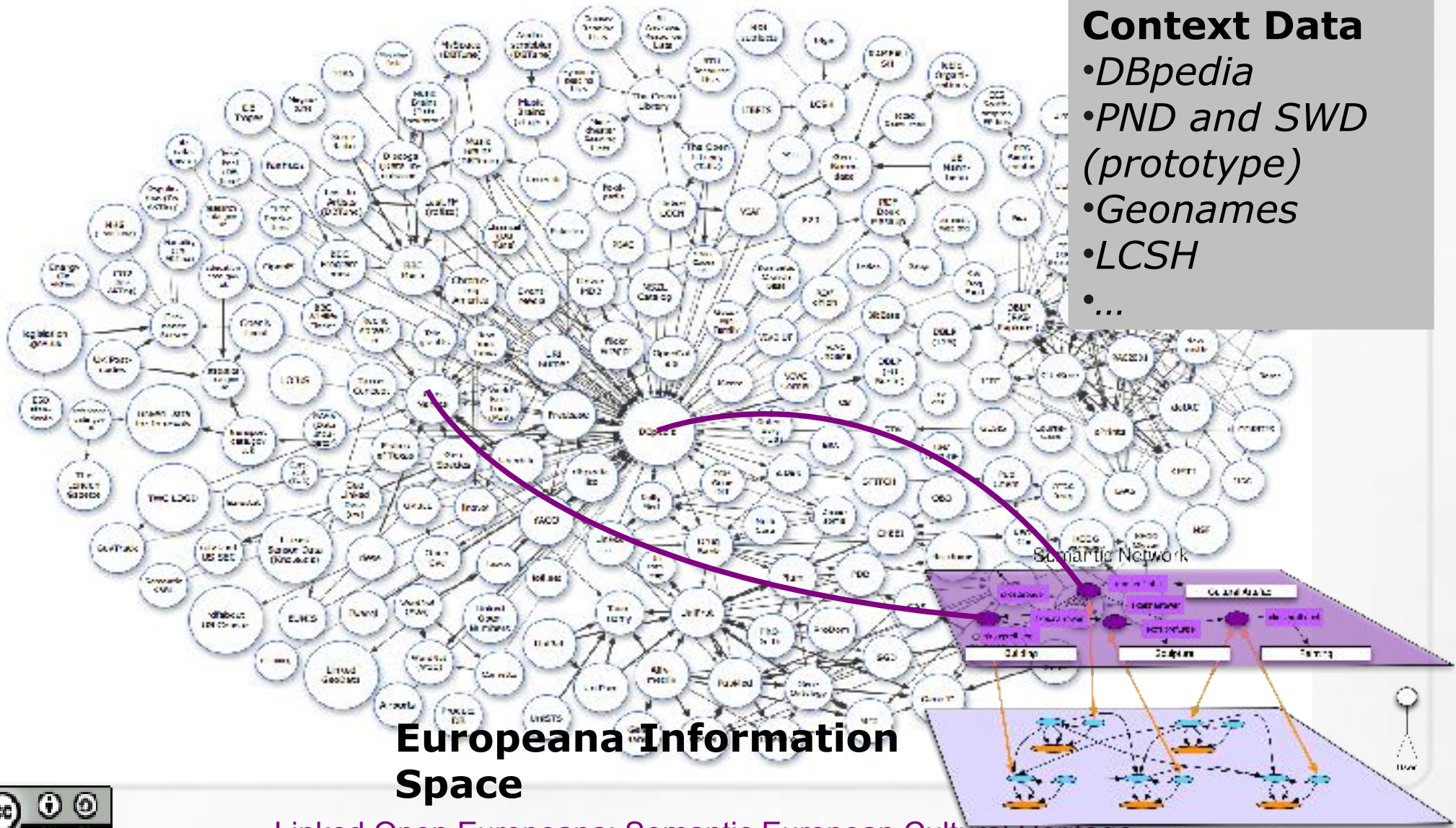


Networked Object Representations

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EDM and Linked Open Data



Context Data

- DBpedia
- PND and SWD (prototype)
- Geonames
- LCSH
- ...

Europeana Information Space

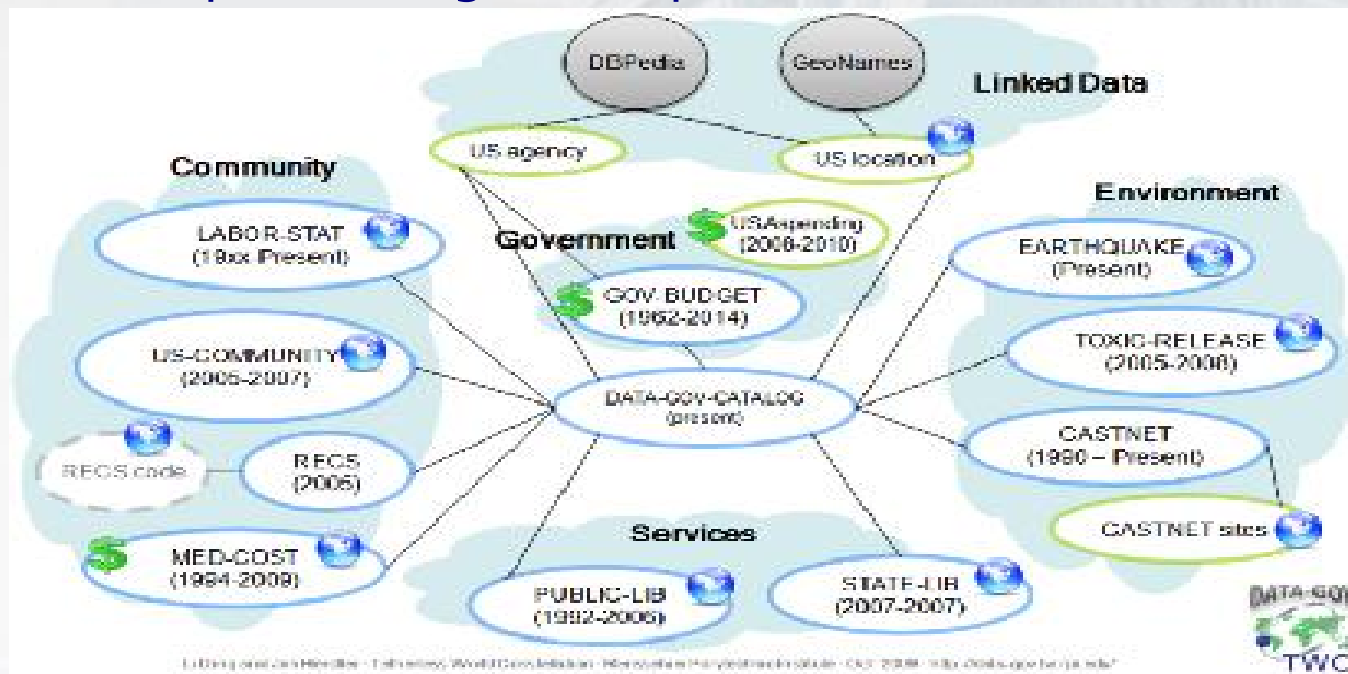
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... and what can you do with that?

What if ...

- Europeana EDM is fully implemented and data migrated.
- Data originating from public bodies (PSI) are available as LoD
 - As in <http://data-gov.tw.rpi.edu/wiki/>:



- And we combine all this with the rest of the Cloud: what use to make of all this? → Into knowledge generation!

→ Visualise Triples and Context



→ Visualise Cultural Context

Mapping the Republic of Letters:

<https://republicofletters.stanford.edu/#maps>

Or again the Finnish example (Kulttuurisampo):

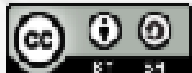
<http://www.kulttuurisampo.fi/kulsa/historiallisetKartat.shtml>

... and the political bit

On the Importance of being 'Open' (1)



- “Openness (allowing access) is separate question.” (TBL, [http://www.w3.org/2008/Talks/0617-lod-tbl/#\(22\)](http://www.w3.org/2008/Talks/0617-lod-tbl/#(22)))
- Does Linked Data work **without being 'open'**?
 - Technically speaking: yes (cf. pharma industry or biomedical data)
 - But it gets quite expensive that way ...
 - ... much too expensive, probably, for Europeana to afford!
 - And much of its 'semantic' charms of open flow of RDF statements and reasoning potential would be lost in such a setting, anyway.
- As a consequence, we aim at Europeana data being **Open Linked Data** (more in a Europeana Foundation statement at <http://bit.ly/fe637P>) and at Europeana data being under CC0!



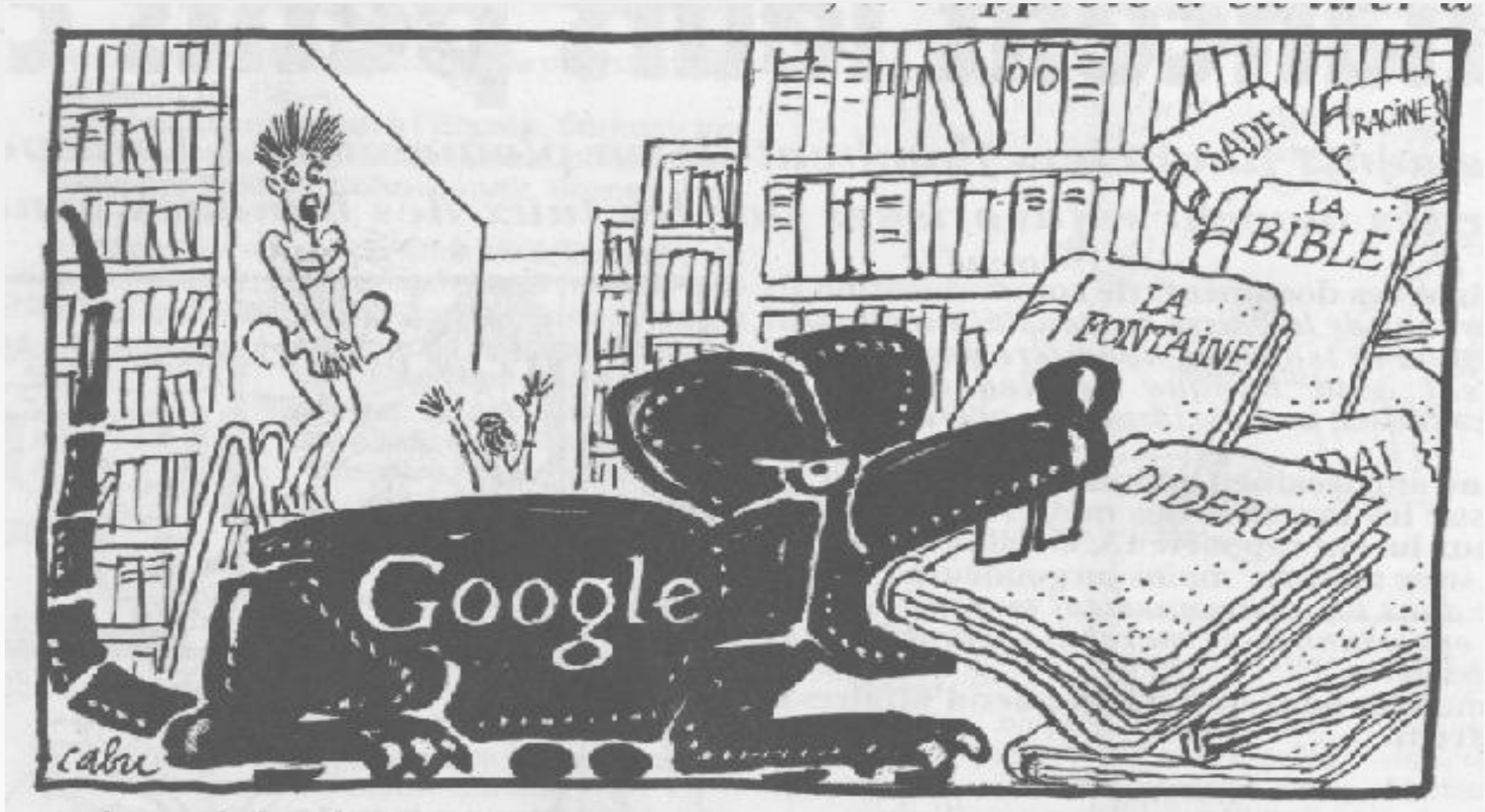
On the Importance of being 'Open' (2)



- This has a number of **implications**
 - No control over data usage
 - No income to be generated from data access and use
 - Innovative and (commercially) attractive services can be built on LoD
- → Do not repeat mistakes we are very familiar with from the Open Access debates of the past 10 years!
 - 'open' vs. 'free',
 - 'free' vs. 'commercial'
- → Do not exclude commercial reuse for Europeana metadata!
- → What is the actual **value** of context (in business terms!)?



Europeana will have been a Success ...



... once this lovely beast uses our data and functionality!



Selected Reading

- Chris Bizer, Tom Heath, Tim Berners-Lee, T. (2009). Linked Data - The Story So Far. International Journal on Semantic Web and Information Systems, 5(3), 1.
<http://www.citeulike.org/user/omunoz/article/5008761>
- Martin Doerr, Stefan Gradmann, Steffen Hennicke, Antoine Isaac, Carlo Meghini, Herbert van de Sompel: The Europeana Data Model. IFLA 2010 (Gothenburg). Session on „Libraries and the Semantic Web“. <http://www.ifla.org/files/hq/papers/ifla76/149-doerr-en.pdf>
- Stefan Gradmann: Knowledge = Information in Context: on the Importance of Semantic Contextualisation in Europeana. Europeana White Paper 1.
<http://www.scribd.com/doc/32110457/Europeana-White-Paper-1>
- Eero Hyvönen: Preventing Interoperability Problems Instead of Solving Them. Semantic Web Journal, no. 2-3, December, 2010.
<http://www.semantic-web-journal.net/content/new-submission-preventing-interoperability-pro>
- A lot more mercifully skipped ...

A faded, light blue background image of a large, multi-story building with many windows, likely a university building.

Thank you for your attention!